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Bird Detection and Radar Wind Profilers

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Radar wind profilers (RWPs) are a very sensitive class of operational and research-grade meteorological radars designed specifically to detect clear air turbulence in the atmosphere. These systems have been designed with frequencies ranging from 50 MHz to 3 GHz and antenna sizes from about 1 m to >1 ha. Unlike NEXRAD systems, the antennas do not move or scan but rather are stationary and use phase-shifter arrangements to point the beam. Using the Doppler-shifted backscatter return, winds profiles can be measured from near the ground to as high as 20 km in 5- to 60-minute intervals. RWPs have been used now for over 10 years for operational weather forecasting and atmospheric research, with upwards of a hundred or so operating throughout the USA. From the beginning, it became obvious that birds flying at various altitudes could interfere with the gathering of quality wind data. In particular during bird migration events in the spring and fall, significant amounts of wind data can be lost. Algorithms have been developed to screen out contaminated data, but the contaminated data, potentially useful to ornithologists, is not currently further processed. This paper will present information about various types of clear-air radar wind profilers, how they operate, the data products they produce, current users of RWP data, and the possible use of RWP data in the bird strike community.